

065051

JPRS-TTP-85-028

18 November 1985

Worldwide Report

TELECOMMUNICATIONS POLICY, RESEARCH, AND DEVELOPMENT

DISTRIBUTION STATEMENT A

Approved for public release;
Distribution Unlimited

19980605 194

DTIC QUALITY INSPECTED

FBIS

FOREIGN BROADCAST INFORMATION SERVICE

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

0
71
A04

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service, Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semi-monthly by the National Technical Information Service, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

18 November 1985

WORLDWIDE REPORT

TELECOMMUNICATIONS POLICY, RESEARCH AND DEVELOPMENT

CONTENTS

ASIA

AUSTRALIA

REUTER Buys Majority Shareholding in Visnews (Hong Kong AFP, 29 Oct 85)	1
--	---

JAPAN

Briefs	
Public Phone Service From Aircraft	2
Opposition to NTT-IBM Venture Withdrawn	2
Marubeni Starts VAN Telecommunications	2
NTT Adopts International Standards	3

PEOPLE'S REPUBLIC OF CHINA

Development of China's Microwave Communications Discussed (Zhong Yunruo; Shanghai XIANDAI TONGXIN, No 7, 8 Jul 85) .	4
Wu Lengxi Inspects Heilongjiang Provincial Broadcasting Work (Heilongjiang Provincial Service, 14 Aug 85)	7
Jiangxi Completes 3 Satellite TV Ground Stations (Jiangxi Provincial Service, 10 Sep 85)	8
Xizang Opens Satellite-Relayed TV Station (Xizang Regional Service, 12 Sep 85)	9
Briefs	
Hebei Posts, Telecommunications	10
Heilongjiang Satellite Station	10

EAST EUROPE

POLAND

Satellite Navigation System Tested (Andrzej Felski, Stanislaw Zarychto; Warsaw PRZEGLAD GEODEZYJNY, No 1, Jan 85)	11
Advances in Optotelecommunications Engineering (Ryszard Wolak; Warsaw TRYBUNA LUDU, 25 Jul 85)	16

LATIN AMERICA

ARGENTINA

Requirements for Informatics Technological Development Debated (Buenos Aires MERCADO, 26 Sep 85)	18
Resolution 44 Discussed	18
Brazilian Policy	20
Technology Transfer	21
Correo Rules Out Policy Changes, Carlos Maria Correa Interview	24
Domestic Industry Prospects Reviewed, by Domingo A. Trassens	25

BAHAMAS

Broadcasting Chief Discusses ZNS' Policy on Politics, Parties (Anthony Forbes; Nassau THE TRIBUNE, 25 Sep 85)	27
--	----

BRAZIL

Social Communications Committee Installed (Brasilia Domestic Service, 29 Oct 85)	29
---	----

JAMAICA

GLEANER Criticizes Seaga's Policy on Media (Editorial; Kingston THE SUNDAY GLEANER, 29 Sep 85)	30
---	----

NEAR EAST/SOUTH ASIA

EGYPT

Communications Projects With Sudan (Cairo THE EGYPTIAN GAZETTE, 8 Oct 85)	32
--	----

IRAN

Briefs New Transmitters	33
----------------------------	----

NEPAL

Problems Faced in Developing Television Service, Programs (Kedar Man Singh; Hong Kong AFP, 30 Oct 85)	34
--	----

SUB-SAHARAN AFRICA

INTER-AFRICAN AFFAIRS

Regional Conference Calls for Training of Experts (Blantyre DAILY TIMES, 2 Oct 85)	36
---	----

ANGOLA

Briefs New Station Inaugurated	37
---	----

GABON

Radio, TV Network Extension Project Announced (Paris AFP, 6 Oct 85)	38
--	----

LIBERIA

Broadcasting Renovation Increases Reception (Monrovia NEW LIBERIAN, 8 Oct 85)	39
--	----

MOZAMBIQUE

Swedish Grant for Telecommunications, Training (Maputo NOTICIAS, 13 Sep 85)	40
--	----

SOUTH AFRICA

Briefs TV 4 Audiences	42
--------------------------------	----

ZAIRE

Belgium Approves Assistance Program to OZRT (Kinshasa AZAP, 6 Sep 85)	43
--	----

ZIMBABWE

Briefs Maputo Micro-Wave Link Ready	44
Symposium on Space Link	44
Symposium on Satellites	44

WEST EUROPE

AUSTRIA

Industry Spokesman on Progress, Prospects of Teletext (Anton Gatnar Interview; Vienna INDUSTRIE, 4 Sep 85)	45
--	----

FRANCE

Alcatel-Thomson Joins U.S. Firm in Space Telecommunications (D. Levy; Paris ELECTRONIQUE ACTUALITES, 8 Mar 85)	51
Thomson Telecommunications, CIT Alcatel Merge (Paris ELECTRONIQUE ACTUALITES, 19 Apr 85)	53
Arianespace Proposes New Kind of Satellite Insurance (Paris AFP SCIENCES, 19 Sep 85)	54
SAT Develops New Kind of Voice-Data Transmission System (Paris ELECTRONIQUE ACTUALITES, 20 Sep 85)	56
Matra of France Works on Software for Low-Orbit Space Vehicles (Paris ZERO UN INFORMATIQUE HEBDO, 23 Sep 85)	58
Briefs CNET Facility Enlarged	62

SWITZERLAND

Post Office Plans Large Investments, Innovations (Geneva JOURNAL DE GENEVE, 21-22 Sep 85)	63
--	----

AUSTRALIA

REUTER BUYS MAJORITY SHAREHOLDING IN VISNEWS

HK290716 Hong Kong AFP in English 0655 GMT 29 Oct 85

[Text] Sydney, Australia, Oct 29 (AFP)--REUTERS has acquired a majority shareholding in Visnews, the international television news agency, Visnews announced here today.

At its first annual general meeting held outside Britain, Visnews said that REUTERS had increased its holding from one third to 55 per cent through the purchase of shares from the British Broadcasting Corporation (BBC).

The BBC's stake in Visnews is now 11.25 per cent, the same level as the other shareholders--the Canadian Broadcasting Corporation (CBC), the Australian Broadcasting Corporation (ABC) and the Broadcasting Corporation of New Zealand (BCNZ).

Under an agreement approved by the Visnews board today, REUTERS will pay 2.6 million pounds sterling (3.7 million dollars) in cash to the BBC.

Visnews is the biggest company in its field, supplying daily television news coverage from all over the globe to broadcasters in 83 countries.

REUTERS Managing Director Glen Renfrew said his agency's majority shareholding in Visnews would enable REUTERS to develop the overlapping interests in the two companies, particularly in communications and news pictures and newsfilm distribution.

/6091
CSO: 5500/4309

JAPAN

BRIEFS

PUBLIC PHONE SERVICE FROM AIRCRAFT--Tokyo, Oct. 1 KYODO--Nippon Telegraph and Telephone Corp. (NTT) said Tuesday it plans to make in-flight pay telephone service available on domestic air routes from next April. NTT will launch the service aboard some 90 Japan Air Lines (JAL), All Nippon Airways (ANA) and Toa Domestic Airlines (TDA) aircraft, installing some 120 card pay phones, the company said. Fees will be 500 yen per minute, NTT said, adding that the service will not enable passengers to receive calls from the ground. NTT will be the second firm to offer this service. Air Fone of the United States began a "flying" public phone service last October on U.S. domestic routes. The Ministry of Posts and Telecommunications is working on the relevant laws for the service. [Text] [Tokyo KYODO in English 0239 GMT 1 Oct 85 OW]

OPPOSITION TO NTT-IBM VENTURE WITHDRAWN--Tokyo, Oct. 8 KYODO--Japanese communication equipment makers Tuesday decided to withdraw their opposition to a planned joint venture between Nippon Telegraph and Telephone Corp. (NTT) and IBM Japan Ltd., a subsidiary of International Business Machines Corp. (IBM) of the United States. A spokesman for the Communication Industries Association of Japan (CIAJ) said the CIAJ, which has opposed the plan, maintaining that the venture between two "giant companies" would run counter to the principle of free competition, came to the decision for fear of intensifying the already acute Japan-U.S. trade friction. The joint venture plan calls among other things for development of common communications software, sales of IBM computers, establishment of a joint venture firm before the end of December and development of "value added network" (VAN) services--integrated services linking different computer systems--both in Japan and abroad. [Text] [Tokyo KYODO in English 1135 GMT 8 Oct 85 OW]

MARUBENI STARTS VAN TELECOMMUNICATIONS--Tokyo, Oct. 9 KYODO--Marubeni Corp. said Wednesday its joint venture with McDonnell-Douglas Corp. of the United States will start value added network (VAN) telecommunications services across Japan in December. The joint company, network service, will be the first trading firm-initiated venture to start a VAN business in Japan. It said computing centers in five major cities--Sendai, Tokyo, Nagoya, Fukui and Osaka--have been linked with a circuit leased from Nippon Telegraph and Telephone Corp. (NTT). The company said the network will be extended by the end of October to connect with 10 more cities: Sapporo, Niigata, Toyama, Kanazawa, Shizuoka, Hamamatsu, Okayama, Hiroshima, Takamatsu and Fukuoka.

Network service capitalized at 800 million yen, was inaugurated by 31 companies, including Marubeni, McDonnell-Douglas and Fuyo Group firms, led by Fuji Bank. It receives technical aid from Tymnet, an affiliate of McDonnell-Douglas and the world's largest VAN enterprise, based in California. The company expects Fuyo Group companies, major supermarkets and other organizations to become users. It hopes for initial year sales of 500 million yen, doubling in the second year. [Text] [Tokyo KYODO in English 1136 GMT 9 Oct 85 OW]

NTT ADOPTS INTERNATIONAL STANDARDS--Tokyo, Oct. 16 KYODO--Nippon Telegraph and Telephone Corp. (NTT) will adopt universal digital transmission standards being promoted by the International Telegraph and Telephone Consultative Committee (CCITT), NTT President Hisashi Shinto said Wednesday. NTT's version of a digital transmission network, called the information network system (INS) and planned to start next year, will send information through optical-fiber cables at the speed of 88 kilobits per second compared with 144 kilobits of the CCITT standards, which most European countries and the United States plan to apply. Shinto told a press conference that at the start the INS will use the 88-kilobit system but that later adjustments of digital switching systems will enable the INS to conform with the CCITT standards. [Text] [Tokyo KYODO in English 1157 GMT 16 Oct 85 OW]

CSO: 5560/032

PEOPLE'S REPUBLIC OF CHINA

DEVELOPMENT OF CHINA'S MICROWAVE COMMUNICATIONS DISCUSSED

Shanghai XIANDAI TONGXIN [COMMUNICATIONS TODAY] in Chinese No 7, 8 Jul 85
pp 1-2

[Article by Zhong Yunruo [6988 0336 5387], Assistant Director of the Institute of Posts and Telecommunications Science: "Develop China's Microwave Communications"]

[Text] Microwave communication is a modern means of communications. The first microwave communication circuit in the world has only been in existence for a little more than 30 years, however, because of its outstanding advantages, it has been rapidly developed in all nations. In the communications circuits in the U.S., more than 70 percent are microwave circuits. In other countries, microwave communication is used at between 50 to 70 percent. Microwave communication is so widely used because of its high capacity, low capital costs, fast rate of construction, high resistance against disasters, adaptability to various terrains, and ability to meet the quality requirements of modern communications. In recent years, microwave communication is being developed in the directions of high capacity, low energy consumption, miniaturization and unmanned operation. In addition, it is capable of satisfying all the requirements in digital communications. Therefore, microwave communication has already become an indispensable means in modern communications.

China started early in microwave communication. However, its development is lagging behind due to many reasons. Based on a report of the Ministry of Posts and Telecommunications to the Central Committee of the Chinese Communist Party in 1956, Comrade Mao Zedong clearly pointed that we wanted to develop microwave communications in China. In the late 1960's and early 1970's, China already had the ability to manufacture microwave communication equipment. Comrade Zhou Enlai made many important arrangements in microwave construction and personally determined the microwave routes and construction policies. In 1962, a microwave communication system with a capacity of 60 telephones and one television channel was developed. In addition, some experimental circuits were also developed. In 1966, a large capacity microwave system with 600 telephone lines was successfully developed to reduce the gap between microwave communication in China and that of the world to approximately 10 years. In 1972, China successfully developed a semiconductor based microwave communication system capable of handling 960 telephone lines and one

television channel. In 1974, China approximately had 10,000 kilometers of microwave communication lines, connecting 26 provinces and cities to transmit color television programs, connect telephones and deliver facsimile editions of RENMIN RIBAO. The May Day celebration was transmitted via microwave to Guangzhou in 1974. An amateur radio operator in Hong Kong received the color television program from Beijing by using a high efficiency antenna. He wrote a beautiful letter to praise the new technology.

The capacity of a microwave communication circuit is very large. The 1,800 line microwave communication system developed by China could simultaneously transmit over 8 channels and each channel could handle 1,800 telephone calls or 1 color television program. With new breakthroughs in technology, other countries have developed larger capacity microwave equipment in recent years. The capacity per channel is increased to 2,700, or even 6,000, telephone calls to fully demonstrate the superiority of microwave communications. Microwave, similar to light in characteristics, is transmitted in a straight line. It can be transmitted to a distance of several thousand kilometers by building a relay station every 50 kilometers or so to amplify and retransmit the signals. Microwave communication can adapt to various terrains. It can easily cross mountains and lakes. The microwave circuits built in China are crossing over the Qinling Mountain and the Wutai Mountain, as well as the Huanghe River, the Changjiang River and the Taihu Lake. Furthermore, microwave circuits are scattered as points and the signals are transmitted in the air. Therefore, it has a stronger tolerance against disasters. In 1975, 17 counties in Henan were flooded and all means of communications were cut off. The microwave circuit between Beijing and Guangzhou which goes through the disaster area, however, was operating normally. In early 1983, the Northeast was belted by a blizzard and all communications over land were interrupted. The microwave circuit of the Ministry of Water Resources and Electric Power temporarily solved the problem. During the Tangshan earthquake, the microwave line between Beijing and Shenyang was operating normally. From these facts, it is obvious that the disaster resistance of microwave lines is superior. Because in microwave communication a relay station has to be built in every 50 kilometers, the construction can begin in parallel. Thus, the speed of construction is very fast. In a period of over 3 years from 1969 to 1972, China completed microwave lines to cover more than 10,000 kilometers. In another 3-year period from 1980 to 1983, special microwave circuits were built by various departments in hydropower, petroleum and broadcasting to cover more than 20,000 kilometers. The rate of construction is very fast. As for the investment required, the price tag per kilometer differs due to factors such as capacity, terrain, etc. On the average, the cost per kilometer for the microwave circuits built in the early 1970's is around 20,000 yuans. The cost for co-axial cable per kilometer, however, is approximately 106,000 yuan. Therefore, as long as we pay attention on saving money, the cost of microwave is approximately one-fifth of that of cable. In addition, we will save large amounts of copper and lead.

The advantages of microwave communication have long been demonstrated in practice in China. Due to various reasons, however, the development of microwave communication in China followed a tortuous path. First, because microwave communication was a leading edge technology, China did not have a good foundation. Due to the 10-year period of chaos, there are many technical

and quality problems in scientific research, production, construction and maintenance to make the quality of existing microwave circuits unstable. Similar situations also took place in developed nations such as the U. S., Japan and France. The first microwave circuit in the U. S. broke down 225 times in the first 6 months. In the early stage in Japan, more than 1,000 kilometers of microwave equipment was scrapped due to quality related reasons. In France, it took approximately 10 years since the completion of its microwave circuit to improve quality thoroughly. It took about 7 years of technical reform to stabilize the quality of communications in the initial microwave circuit built in China, which seriously affects the further development of microwave systems. In addition, due to the lack of an overall understanding of security in communications, all communication lines are required to be secured. Thus, the utilization and development of microwave circuits is limited. In some areas, microwave is not utilized in spite of its superior quality. A great deal of money is invested to maintain security in a few cases. This problem may be resolved by formulating economic and rational measures after reviewing the situations in the world. If we open the large number of civilian telephone lines on microwave and maintain security measures for a few necessary lines, then not only a great deal of money can be saved in the construction of communications network in China but they also can be built more rapidly. Based on the experience abroad, existing microwave circuits can be continuously upgraded with new technology in order to expand capacity, improve performance and meet the needs in communications. Initially, the microwave circuit in the U. S. could only handle 480 telephone calls per channel. Through numerous improvements, the capacity has been increased. Some of them have been upgraded to 2,400 calls. Moreover, because of the successful development of the pressure expansion single band modulation method, capacity can still increase in multiples. Most of the provinces, cities and autonomous regions in China are linked by existing microwave circuits. If the lines can be upgraded by using matured technology, not only the capacity can be increased but also the stability can be improved. Most of the stations can be operated unmanned to improve efficiency and cut costs.

We are facing the challenge from new technology. Microwave communication will sooner or later be rapidly developed. In the near future, microwave communication, in conjunction with optical fiber communication and satellite communication, will be used to form a modern communication network. We must realize this trend and start our preparation and planning in order to complete a modern communication network early and to promote the realization of the four modernizations.

12553
CSO:5500/4130

PEOPLE'S REPUBLIC OF CHINA

WU LENGXI INSPECTS HEILONGJIANG PROVINCIAL BROADCASTING WORK

SK150528 Harbin Heilongjiang Provincial Service in Mandarin 1000 GMT 14 Aug 85

[Text] This morning Comrade Wu Lengxi, chairman of the All-China Journalists' Association and former minister of the Ministry of Radio and Television, held a forum with staff members and workers engaging in radio and television broadcasting work. He encouraged the participants to vigorously do a good job in carrying out radio and television broadcasting work in order to bring into better play the role of radio and television broadcasting as the party's mouthpiece.

Prior to the forum, Comrade Wu Lengxi visited the Heilongjiang Provincial People's Broadcasting Station and the provincial television station and heard briefings given by the responsible personnel of the provincial radio and television department and of the two stations. Then he held a forum with these personnel, at which Comrade Wu Lengxi stated: Heilongjiang Province occupies an important position in our country's program of building the four modernizations. He expressed the hope that the workers engaged in radio and television broadcasting work throughout the province will earnestly study the important speech given by Comrade Hu Yaobang concerning journalism and bring into full play the role of radio and television broadcasting as the party's mouthpiece in order to steadily upgrade the quality of radio and television programs and to better serve the program of building socialist material and spiritual civilizations.

CSO: 5500/4132

PEOPLE'S REPUBLIC OF CHINA

JIANGXI COMPLETES 3 SATELLITE TV GROUND STATIONS

OW111109 Nanchang Jiangxi Provincial Service in Mandarin 1100 GMT 10 Sep 85

[Text] The installation of equipment provided by the State Council to Jiangxi for setting up three ground stations designed to receive satellite-relayed televised programs has been completed. The Nanchang station was commissioned on 17 August, and the other two -- the (Sanxianling) station in Shangrao Prefecture and the (Fengshan) station in Ganzhou Prefecture -- were commissioned on 6 and 8 September respectively. The television signals received through these stations are clear and stable, the color is vivid, and the sound loud and clear.

These stations are the first three to be completed in Jiangxi. Thanks to the correct leadership and attention of the various departments concerned, and especially to Vice Premier Li Peng's recommendations for the construction of these stations, all those who took part in the construction project were greatly encouraged.

The successful completion of the three stations is the result of the efforts of the No 39 and No 14 institutes and the No 924 plant under the Ministry of Electronics Industry, which provided the equipment and sent a technical support team headed by their chief and deputy chief engineers, and the around-the-clock cooperation of personnel of the technical office of the provincial radio and television department, the provincial television station, and the (Sanxianling) and (Fengshan) television stations.

CSO: 5500/4132

PEOPLE'S REPUBLIC OF CHINA

XIZANG OPENS SATELLITE-RELAYED TV STATION

HK131225 Lhasa Xizang Regional Service in Mandarin 1130 GMT 12 Sep 85

[Text] On the evening of 11 September, Xizang officially opened the Lhasa satellite-relayed TV station. This is one of the five satellite-relayed TV stations presented by the State Council to the region. This is also another example of the profound concern of the CPC Central Committee and the State Council for the region's people of various nationalities.

Located on the southwestern border of China, the region is a mountainous area with a scattered population and a limited television broadcasting coverage area. In order to enable the region's people of various nationalities to promptly watch the programs of China Central Television, the CPC Central Committee and the State Council recently decided to present five satellite-relayed television stations to the region. These television stations are located at Lhasa, Linzhi, Shannan, Rikeze and Naqu.

In the course of construction, engineers and technicians of the Ministry of Aeronautics Industry, the No 1 research institute, and the region's departments concerned made great and concerted efforts. They strived to promptly complete construction of the five satellite-relayed television stations and put them into operation.

During the construction stage of the Lhasa satellite-relayed television station, engineers and technicians solved many problems despite the press work. They completed the high-quality installation and adjustment within 3 days.

This (Sui Pin Duan) 6-meter [dish] satellite-relayed television station is used to directly receive programs of China Central Television transmitted by international satellite. In addition, with the use of (Cha Zhuan) equipment, the signal received is promptly relayed to viewers through the television system. This kind of television station is suitable for broadcasting in remote areas, provinces, cities, prefectures, counties, coastal areas, islands, [words indistinct], factories, mines, enterprises and units. This kind of television station can receive multi-channel programs transmitted simultaneously by an international satellite, so that viewers can watch a sharp and steady picture and can listen to clear sound.

The opening of the Lhasa (Sui Pin Duan) 6-meter [dish] satellite-relayed television station will greatly improve the reception quality of channel one's programs of China Central Television. Viewers can now watch sharp pictures as well as listen to clear sound.

CSO: 5500/4132

PEOPLE'S REPUBLIC OF CHINA

BRIEFS

HEBEI POSTS, TELECOMMUNICATIONS--Shijiazhuang, 15 Aug (XINHUA)--In less than a year, Hebei Province has set up 1,312 post and telecommunications agencies in townships and towns through various ways. The number of townships and towns that have established their own post and telecommunications organs or set up agencies to handle this work has exceeded 2,600, accounting for 71 percent of the province's total townships and towns. In addition, the province has also set up 2,594 new stations in rural areas to handle mail and newspapers, bringing the percentage of the province's villages having this service to 78.6. [Text] [Beijing XINHUA Domestic Service in Chinese 0747 GMT 15 Aug 85 OW]

HEILONGJIANG SATELLITE STATION--A ground satellite reception station was completed in Fuyuan County of Heilongjiang Province, the easternmost corner of the motherland, on 15 September. The people in Fuyuan can watch the programs of the central television station on the same day. [Text] [Harbin Heilongjiang Provincial Service in Mandarin 1000 GMT 17 Sep 85 SK]

CSO: 5500/4132

POLAND

SATELLITE NAVIGATION SYSTEM TESTED

Warsaw PRZEGLAD GEODEZYJNY in Polish No 1, Jan 85 pp 3-4

[Article by Andrzej Felski and Stanislaw Zarychto of the Higher Naval School, Gdynia: "Testing the Accuracy of the Transit System MX 1102 Receiver"]

[Text] Introduction

This article presents the test results on the accuracy of fixing the position of a stationary object of navigation with the aid of a shipboard Transit satellite navigation system receiver. Attention is focused on the pronounced dependence of position error on the angle of culmination and how position accuracy varies with the satellite being used for observation.

The increasing requirements relative to fixing a ship's position and the dynamic development of space technology and techniques are the primary causes for the development in the mid-1960's of the first Transit satellite navigation system. Today it is the most widely used satellite navigation system among several such systems in operation. Some of the incontrovertible advantages of this system are: its area of operation covers practically the entire earth; its measurements are very accurate; and it is practically independent of hydrometeorological conditions.

The Transit System MX 1102 Receiver

Even though the history of the development of the Transit system spans many years, it was only in the 1980's that this system's receivers became widely used shipboard navigation equipment. This happened in conjunction with the appearance of receivers that were so automated that they could be operated by a navigator or a person not qualified in electronics or computer science. The MX 1102 is a typical example of such equipment. It consists of two basic units: a receiver antenna with a built-in preamplifier and a main unit containing the remaining circuits. The equipment is connected to a log and a gyrocompass in order to take into account the movement of a vessel during communications with a satellite as well as during periods of non-communications with a satellite. This receiver is extensively automated, which minimizes monitoring operations. The data, especially geodetic coordinates and their respective times, are displayed in digital form on a monitor.

The operation of a MX 1102 receiver, just like the operation of other satellite navigation receivers, can be divided into the following cycles:

- initiating the operation (inputing initial data);
- fixing the observed position;
- calculating the path between position observations;
- automatic monitoring.

The basic cycle of operation--fixing an observed position--occurs automatically without the navigator's help and immediately after the satellite appears in the receiver's radio visibility zone.

The many advantages of the presented system and the high degree of the receiver's automation are reasons why navigators often arrive at a fixed position so easily. However, satellite systems are so different from traditional navigation systems that evaluating the accuracy of satellite-based navigation also requires a different approach. It should be understood that the accuracy of navigating with the aid of this type equipment means the accuracy of the calculated-observed position. Of course, this accuracy depends on the accuracy of the observed position and the accuracy of calculating the path.

Test Results on the Accuracy of the MX 1102 Receiver

The main purpose of the referenced MX 1102 receiver tests was to evaluate the fixing position errors of an observed stationary object. The object of the tests was to obtain position data with the aid of a stationary receiver mounted on a ship during a series of 24-hour periods over a time span of 1 year. Total observation time was 846 hours during which 926 positions were observed, of which 733 were evaluated as correct by the receiver's software. During the entire time measurements were taken, the position of the receiver antenna was fixed. It was ascertained that the water level did not vary significantly (± 10 cm) during the entire time measurements were being taken.

Based on the available literature, it was assumed that the distribution of position coordinates observed with the aid of a shipboard satellite navigation system receiver would be a random-value normal distribution, and that the error in both variables (geodetic length and width) would be uncorrelated. The gathered data was checked by verifying the above assumptions. At a 0.01 level of significance, it was shown that no basis exists to reject the hypothesis that position coordinates are subject to a normal distribution. It also was determined that the error correlation coefficient for both coordinates is no greater than 1×10^{-10} , from which it was assumed that the variables are not mutually correlated.

The position root-mean-square error for the total data population and for the various subgroups of data selected on the basis of season of the year, time of day and satellite number were determined (Table 1).

The root-mean-square error based on the total data is $M = 143$ m with $P = 63$ percent (the manufacturer specifies 93 m with $P = 50$ percent). This value does not vary significantly for different seasons of the year or different times of the day, except for the series of measurements taken between 19 to 26 January 1983 when it was ascertained that $M = 88$ m. The mean position for the individual series of measurements did not vary more than $0.01'$, which is equal in detail to the projected results.

The accuracy of the navigation receivers (and the satellite system receivers) can be described by a composite index based on the generally accepted position root-mean-square error. The stability of this parameter for the entire system does not mean that its value is constant for different satellite systems. See Table 1. In addition, position root-mean-square error was determined relative to the entire range of satellite culminations (7 deg to 70 deg) permitted by the equipment. According to references 1, 3 and 6, for older receivers there is a close dependence between error M and a satellite's angle of culmination. The correlation between position error and satellite culmination angle was investigated using the collected data as a base. The observations were divided into 12 culmination angle ranges, with each range encompassing seven degrees. The calculations take into account not only the positions designated by the equipment as correct (in the 7 deg to 70 deg culmination angle range) but also those positions outside this range. The achieved values are presented in Table 2 and in Figure 1.

Table 1. Position Root-Mean-Square Error

(1)		(2)
Zbiór danych		M (m)
(1)	Całość danych	143
(2)	Zima	88
(3)	Wiosna	145
(4)	Lato	153
(5)	Jesień	155
(6)	Noc	143
(7)	Dzień	149
(8)	Satelita 200	179
(9)	Satelita 190	158
(10)	Satelita 140	140
(11)	Satelita 480	112
(12)	Satelita 130	113

Key:

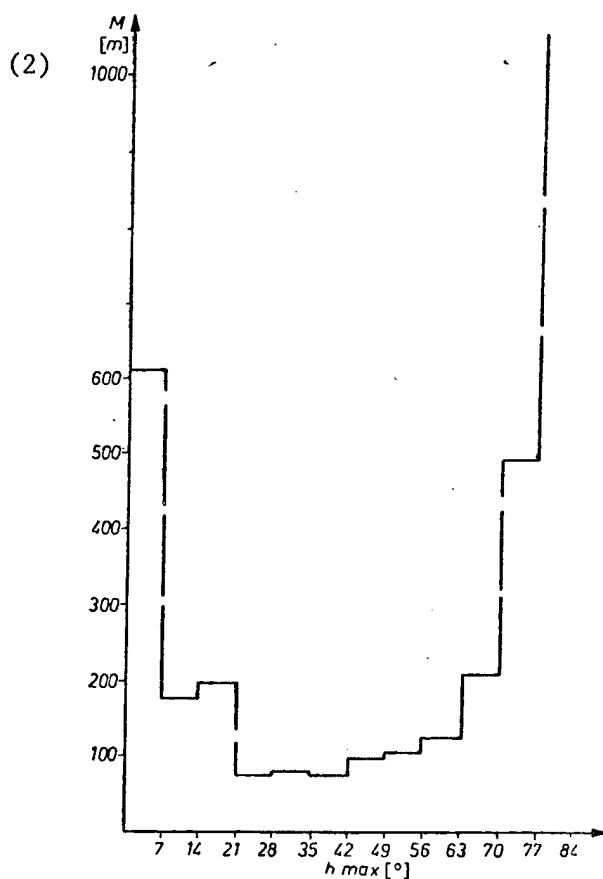
1. Data set
2. Meters
3. Total data
4. Winter
5. Spring
6. Summer
7. Fall
8. Night
9. Day
10. Satellite 200
11. Satellite 190
12. Satellite 140
13. Satellite 480
14. Satellite 130

Table 2. Position Error as a Function of Satellite Culmination Angle (Total Measurements)

(1)	Kat kulmi- nacji	1—6	7—13	14—20	21—27	28—34	35—41	42—48	49—55	56—62	63—70	71—80	81—90
(2)	M (m)	614,5	174,7	197,9	76,4	77,2	77,5	98,2	105,4	123,0	209,1	496,8	1854,0

Key:

1. Angle of culmination
2. Meters



n (2)

Figure 1. Plot of Position Error as a Function of Satellite Culmination Angle

Key:

1. Angle of culmination in degrees
2. Meters

Literature

1. Baranov, K., "Opriedielenie Miasta Sudna s Pomoszczju nawigacionnych Sputnikow," Transport, Moscow, 1976.
2. Jurdzinski, M., Szymonski, M., "Satellite Maritime Navigation Systems," Wydawnictwo Morskie, Gdansk, 1980.
3. Pieskov, I. M., "Ocena Toczności Opriedielenia Miasta Po Sputniku," MORSKOY FLOT, No 11, 1974.
4. Sledzinski, J., "Satellite Geodetics," PPWK [State Map Publication Enterprise], Warsaw, 1978. 5. Urbanski, J. and others, "Evaluating the Accuracy of a Ship's Position," WSMW [Higher Naval School], Gdynia, 1976.
6. Wereszczynski, J., "Basics of Navigation Using Artificial Earth Satellites," PWN [State Publishing House for Scholarly Books], Warsaw, 1971.

11899

CSO: 5500/3032

POLAND

ADVANCES IN OPTOTELECOMMUNICATIONS ENGINEERING

Warsaw TRYBUNA LUDU in Polish 25 Jul 85 p 5

[Article by Ryszard Wolak: "New Fiberoptic Communication Lines; Cooperation With the CEMA Countries"]

[Text] Lublin's OTO [Center for Optotelecommunications Technology], which was formed at the end of 1983, is expanding its activities based on the technology and prototypes of fiberoptics--multilayer conductors of quartz glass having diameters measuring tenths of millimeters that are used in telecommunications and in other areas. The technology and prototypes were developed at the UMCS [Marie Curie-Sklodowska University] Department of Physical Chemistry.

Since its founding, the Lublin center has devoted its time to mastering fiberoptic technology on an industrial scale, and to thoroughly testing fiberoptic production machinery and equipment, which are not even prototypes or models, that are being built in Poland for the first time, including those being built in Lublin's Truck Factory.

Recently fiberoptic conductors were tested at specialized firms in France and Great Britain. The test results confirm their excellent quality and technical characteristics, meeting world-class requirements for this type product, creating the possibility of exporting them to the Western countries.

The first Polish fiberoptic cables have already been delivered to the mining industry, for whom Lublin Polytechnic is building an experimental line to test the movements of a formation. Currently cables are being produced for the railroad for the installation of a test communication line in Warsaw and to monitor operations at the modern Lublin-Tatary marshalling station.

A 120-channel cable for a fiberoptic telephone line in Poznan is also being built, which will be the third one of its type after Lublin and Lodz. The Lodz fiberoptic telephone network is supposed to be expanded this year.

The research and achievements of Lublin's OTO and of UMCS's independent Fiberoptics Technology Laboratory, which is OTO's main scientific facility, are the object of much interest in the CEMA countries. For example, the cooperation between the Combine for Light Sources and Quartz in Sliven, Bulgaria, and Poland is quite advanced. Poland uses Bulgarian-produced quartz

tubing from which optical fibres are drawn. Poland also utilizes Bulgaria's well equipped measurements laboratory to investigate fibre parameters. In the exchange of specialists, the Bulgarians have access to well verified solutions for technical problems that are applied at the Lublin plant.

Other socialist countries also are anxious to buy Polish fiberoptics.

11899

CSO: 5500/3032

ARGENTINA

REQUIREMENTS FOR INFORMATICS TECHNOLOGICAL DEVELOPMENT DEBATED

Resolution 44 Discussed

Buenos Aires MERCADO in Spanish 26 Sep 85 pp 75-76

[Text] Almost 50 firms ultimately entered bids under Resolution 44. As we know, this is the informatics section of a program to spur the electronics industry in fields such as telecommunications and industrial electronics. There are those who say that the resolution was issued too hastily and did not give companies enough time to prepare. But government circles regard informatics as a key, priority field, inasmuch as its development has ripple effects on almost all other activities. According to the undersecretary of informatics and development, Carlos Maria Correa, "informatics poses serious problems for the developing countries. Argentina wasted extremely valuable time for developing it, and it cannot now ignore the technological revolution that it entails."

Resolution 44 is divided into 8 segments of activity. Its aim is to meet national requirements for technological and industrial development in the informatics sector as far as small hardware and the respective peripherals are concerned. The first three segments, A, B and C, include single-user and multi-user equipment and home microcomputers, and the last, H, comprises teleinformatic systems. In between are peripherals, applied systems, small and medium-sized companies and miscellaneous terminals.

Above and beyond the manufacture of equipment and even the provision of "turnkey" systems, one of the main points is technology transfer and, consequently, independent developments. One of the ways to accomplish this is unquestionably to encourage capital formation, albeit with a majority of domestic money. Not all of the major companies operating in Argentina regarded the incentives as sufficient, for example, IBM, Texas Instruments, NCR and Hewlett Packard, among others.

According to experts in the field, however, Resolution 44 is not the final word. The promotional policies that the provinces may offer could also make local production advantageous. At least one of the major companies that did not participate under Resolution 44 is reportedly already involved in such negotiations.

According to the most conservative estimates, total project investment is put at around \$130 million, but the Undersecretariat of Informatics and Development is toying with a figure of some \$180 million. Between \$80 and \$100 million would be needed for the first stage of setting up the plants around the country. Fulfilling the bidding conditions was no easy task, and according to the head man at one of the competing firms, it took at least 10,000 man-hours of highly skilled work just to submit the background information.

Not everyone is happy, of course, with Resolution 44. There has been more than one argument about its timing and, above all, about its leading to what is today being called the "reserved market," a new term for a longstanding problem. The fact is that prospects are different for importers; for the local manufacturers who import some parts (including the companies that could compete with the help of tariffs), and for those who want protection.

Few are totally opposed to the resolution. A good many agree with its objectives but for the most part disagree when it comes to the means of achieving them. There is also agreement that a computer industry needs protection. "In a totally open market there are not enough incentives for local industry. Moreover, in an expensive country like Argentina it does not make much sense to develop an industry that does not have a comparative advantage," asserts Jose Pedro Pagano, the head of Texas Instruments, whose main concern about the resolution is that it might prompt overprotection, which would inevitably lead to a reserved market.

According to him, one of the reasons for promoting the electronics industry here is that the country will not be able to afford the developments that will be made by the next century. And the current communications secretary, Roberto Cobieta, one of the men who has been pushing for a local electronics industry from his post as adviser to the Industry Secretariat, contends that it ought to be promoted only to prevent the gap between us and the countries with state-of-the-art technology from widening. In short, the differences of opinion have to do with "how" the goals are to be reached.

For example, what constitutes reasonable protection? To some, it should not last for more than 5 years or top 50 percent. Such a percentage would level out costs with the country that generates the technology. For example, it would represent the cost differential between a PC in the United States and one in Argentina. Protectionism would start at that point.

Those who have misgivings about Resolution 44 argue, in addition, that the marketplace is better at allocating resources than government is. There is rapid communication between the market and the producer, they assert, and thus the producer always knows what market needs are. Even if we assume that a government official is a sensible resource allocator and is familiar with market requirements, technology changes so rapidly, especially in the computer industry, that obsolescence is a constant threat. How can the government determine or allocate in advance what has to be manufactured? they ask.

Another criticism is that Resolution 44 does not take into account what has already been done so far and would thus distort competition. The bone of contention here would be that the markup would be set by company instead of applied to the entire sector, "which would put those of us who are already manufacturing in the country at an obvious disadvantage," Pagano cautions.

Its supporters simply stress that it is an important step forward, inasmuch as the respective Informatics Law is still before Congress. They admit, however, that it falls short of establishing a national informatics policy, which must encompass, among other things, education, with the required complementary equipment of course.

Once production under Resolution 44 starts up, furthermore, the problem of having a large enough market to recover investments will arise. "We have to start from the premise," it was noted, "that the domestic market is too small to justify the investments that the industry demands. Therefore, new markets will have to be opened, which calls for a stable and consistent export policy."

Brazilian Policy

Buenos Aires MERCADO in Spanish 26 Sep 85 p 76

[Text] The Case of Brazil

The program that Brazil's then military government implemented 8 years ago was clearly "protectionist" because for some segments it promoted domestic capital exclusively and a reserved market in which certain imports were banned. Some observers feel that Resolution 44 is similar, but the government is underscoring the differences rather than the similarities.

According to THE WALL STREET JOURNAL, the Brazilian computer industry that resulted from this protectionist policy has developed unevenly and inadequately. The local version of Silicon Valley was built 2 hours from Sao Paulo, but its products cost three times as much as their American counterparts and, moreover, are of poor quality. They are of such low quality, the paper emphasizes, that they have spawned "a vast black market ranging from smuggled microcomponents to personal computers."

Brazil's informatics policy, which has been charted until 1992, has posted some telling results, however: 140 electronics firms, 90,000 people at work in the industry and a new generation of engineers and technicians.

THE WALL STREET JOURNAL states, moreover, that the strategy of the Brazilian military government was to create a computer industry similar to Japan's. They obviously did not take into account, however, that Japan started out with heavy consumption, "a mountain of money" and a substantial government budget for research and development. Brazil, whose foreign debt is the largest in the Third World, lacks that "fundamental resource" of Japan.

Technology Transfer

Buenos Aires MERCADO in Spanish 26 Sep 85 pp 77-79

[Text] Ever since it was on the drawing board, Resolution 44 has received "strong political support" from the chamber that represents electronics firms, CADIE [Electronics Industry Chamber]. When the bidding envelopes were opened, the names of several major foreign firms appeared, as they and Argentine companies have responded to the government's proposal with a loud "Yes."

To inquire about this backing MERCADO spoke with engineers Horacio Martinez Quintana and Roberto Melo from Bull; Liana Lew, the special projects manager for the TTI-Bradas-Burroughs consortium; Carlos Maria Molina from Micro Sistemas, and Jorge Chorny, an engineer with AutoRede.

Before hearing their views, we should look into the proposals submitted by their firms.

Bull took part in the official bidding along with Jose Cartellone Construcciones, a firm that handles large construction projects; Noblex, which manufactures television sets and household appliances, and NL, a farm sector company. The consortium will set up shop in Santa Fe and produce single- and multiuser microprocessors and supply systems engineering.

Idat, S.A. is made up of Burroughs, a subsidiary of the U.S. firm that markets computer systems, and Bidas, which is active in oil. It has proposed manufacturing multiuser-multitask and teleinformatics systems in Cruz del Eje (Cordoba).

Micro Sistemas, which has its headquarters in Cordoba and an affiliate in Silicon Valley, has joined forces with Olivetti, ATT and SISTECO to manufacture a single-user microcomputer and specific terminals in Cordoba.

AutoRede is a partnership of the Argentine company Autotrol and its Brazilian counterpart Digirede and intends to produce point-of-sale and bank terminals in Santa Fe.

Opinions

These are four of the business groups that back the government's plan to develop an informatics industry and that have submitted major projects. Comprising about a dozen firms, they also represent a school of thought within the electronics industry that might even some day establish an partnership or a business chamber.

"The government's program," they say in reference to Resolution 44, "seeks total integration for the manufacture of the end product, not the establishment of assembly shops."

They feel that this is the first step in spurring the creation and growth of a new informatics industry that can over time achieve its own technological development.